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WHAT IS CLAIMED IS:

1. A molded polyurethane body obtained by reacting
 - a) at least one aliphatic polyol having a molecular weight of 450 to 6000 g/mol and an hydroxyl value of 10 to 235;
 - b) with an aliphatic diisocyanate, a cycloaliphatic diisocyanate or both, in an equivalent ratio of diisocyanate to polyol of 1.2 : 1.0 to 16.0 : 1.0;
 - c) with a diol as a chain lengthening agent having a molecular weight of 60 to 450 g/mol, the NCO index formed from the quotient, which is multiplied by 100, of the equivalent ratio of isocyanate groups to the sum of the hydroxyl groups of polyol and chain lengthening agents lying within a range of 90 to 105; and
 - d) with an at least bifunctional reaction component, which is suitable for subsequent cross-linking, and which reacts with the terminal hydroxyl groups of the polyurethane chain as well as with the acidic hydrogen atoms of the urethane groups and leads to branched-chain reactions, the thermoplastic polyurethane formed by conversion from the components a) through c) in a first step being homogenously mixed in a second step with 0.2 to 25 parts by weight of component d) with respect to 100 parts by weight of the thermoplastic polyurethane, formed into a molded body, and subsequently cross-linked at temperatures from 80 to 240°C.
2. The molded polyurethane body according to Claim 1, obtained by using polyadipates based on ethylene glycol, diethylene glycol, propane diol, butane diol, pentane diol, hexane diol, neopentyl glycol, and combinations of these glycols, polycaprolactones, polycarbonates, polytetrahydrofuranes, or combinations thereof, as well as copolymers of the corresponding monomers, or mixtures of the indicated polymers as polyol component a).

3. The molded polyurethane body according to Claim 1, obtained by using hexamethylene diisocyanate, methylpentamethylene diisocyanate, ethyl butylene diisocyanate, isophorone diisocyanate, cyclohexane diisocyanate, methylcyclohexane diisocyanate, cyclohexane diisocyanate, methylcyclohexane diisocyanate, and/or dicyclohexylmethane diisocyanate, as well as the corresponding mixtures of isomers as component b).
4. The molded polyurethane body according to Claim 2, obtained by using hexamethylene diisocyanate, methylpentamethylene diisocyanate, ethyl butylene diisocyanate, isophorone diisocyanate, cyclohexane diisocyanate, methylcyclohexane diisocyanate, cyclohexane diisocyanate, methylcyclohexane diisocyanate, and/or dicyclohexylmethane diisocyanate, as well as the corresponding mixtures of isomers as component b).
5. The molded polyurethane body according to Claim 1, obtained by using ethane diol, butane diol, pentane diol, hexane diol, diethylene glycol, dipropylene glycol, cyclohexane diol, and/or polytetramethylene glycol as component c).
6. The molded polyurethane body according to Claim 2, obtained by using ethane diol, butane diol, pentane diol, hexane diol, diethylene glycol, dipropylene glycol, cyclohexane diol, and/or polytetramethylene glycol as component c).
7. The molded polyurethane body according to Claim 3, obtained by using ethane diol, butane diol, pentane diol, hexane diol, diethylene glycol, dipropylene glycol, cyclohexane diol, and/or polytetramethylene glycol as component c).

8. The molded polyurethane body according to Claim 1, obtained by using aliphatic and/or cycloaliphatic di-, tri-, and/or polyisocyanates, isocyanates having an allophanate structure, a biuret structure, or uretdione structure having free or blocked isocyanate groups based on hexamethylene diisocyanate, isophone diisocyanate, and/or dicyclohexylmethane diisocyanate, as well as polyurethane prepolymers based on aliphatic and cycloaliphatic diisocyanates having free and/or blocked isocyanate groups as component d).
9. The molded polyurethane body according to Claim 2, obtained by using aliphatic and/or cycloaliphatic di-, tri-, and/or polyisocyanates, isocyanates having an allophanate structure, a biuret structure, or uretdione structure having free or blocked isocyanate groups based on hexamethylene diisocyanate, isophone diisocyanate, and/or dicyclohexylmethane diisocyanate, as well as polyurethane prepolymers based on aliphatic and cycloaliphatic diisocyanates having free and/or blocked isocyanate groups as component d).
10. The molded polyurethane body according to Claim 3, obtained by using aliphatic and/or cycloaliphatic di-, tri-, and/or polyisocyanates, isocyanates having an allophanate structure, a biuret structure, or uretdione structure having free or blocked isocyanate groups based on hexamethylene diisocyanate, isophone diisocyanate, and/or dicyclohexylmethane diisocyanate, as well as polyurethane prepolymers based on aliphatic and cycloaliphatic diisocyanates having free and/or blocked isocyanate groups as component d).
11. The molded polyurethane body according to Claim 5, obtained by using aliphatic and/or cycloaliphatic di-, tri-, and/or polyisocyanates, isocyanates having an allophanate structure, a biuret structure, or uretdione

structure having free or blocked isocyanate groups based on hexamethylene diisocyanate, isophone diisocyanate, and/or dicyclohexylmethane diisocyanate, as well as polyurethane prepolymers based on aliphatic and cycloaliphatic diisocyanates having free and/or blocked isocyanate groups as component d).

12. The molded polyurethane body according to Claim 1, obtained by using paraformaldehyde, melamine-formaldehyde, bisoxazolines and/or epoxide resins as component d).

13. The molded polyurethane body according to Claim 2, obtained by using paraformaldehyde, melamine-formaldehyde, bisoxazolines and/or epoxide resins as component d).

14. The molded polyurethane body according to Claim 3, obtained by using paraformaldehyde, melamine-formaldehyde, bisoxazolines and/or epoxide resins as component d).

Sub A2 15. A method for producing a molded polyurethane body according to Claim 1, comprising the steps of producing a thermoplastic polyurethane molding material from components a) through c) and well homogenizing the polyurethane molding material in a powdered or granular form with component d), and forming the homogenized material into a molded body and subsequently cross-linking at temperatures of 80 to 240°C.

16. The method according to Claim 15, wherein component d) is applied in a liquid, paste-like, or solid form at room temperature in a tumbling mixer by tumbling on the thermoplastic, polyurethane molding material obtained from the components a) through c) in the first step.

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17. A surface material for application in the interior of a motor vehicle comprising the molded polyurethane body obtained according to Claim 1.
18. A packaging for food comprising the molded polyurethane body obtained according to Claim 1.
19. A molded body or film for a hygienic or medicinal application comprising the molded polyurethane body obtained according to Claim 1.
20. A hot-melt adhesive or adhesive material for textile applications comprising the molded polyurethane body obtained according to Claim 1.

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